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AN IMPLEMENTATION OF WINDOWS-BASED HARDWARE INFORMATION UTILITY

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This report is submitted in partial fulfillment of the requirements for the Bachelor of Information and Communication Technology.
(Computer Network)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
KOLEJ UNIVERSITI TEKNIKAL KEBANGSAAN MALAYSIA

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ABSTRACT

The objective and scope on developing a hardware information utility is to help end user to know how to use diagnostic performance hardware in the system. It also gives some knowledge to user how to diagnose their system and user knows their level computer system performance. The methodology during the development of this utility is referred to the waterfall methodology. This method is use because it has a suitable phase that match with the PSM timeline and the system requirement to be developed. The software will be developed on Microsoft Visual C++ and been implant with many mathematic formulas to diagnose processor and memory. Windows platform are suitable environment to run this utility because windows platform are among widely used operating system. This project is important to be developed because it will help end user to know their system performance smoothly during the task. One of the weaknesses of this application is this utility can only be operational on Windows platform.

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ABSTRAK

Objektif dan skop the Hardware Information Utility adalah sebuah utility yang boleh membantu pengguna mendiagnostik kemampuan perkakasan sistem. Utiliti ini juga boleh memberi pengetahuan pengguna mencapai tahap kemampuan sistem. Metodologi yang digunakan dalam membangunkan sebuah Hardware Information Utility adalah model air terjun "Waterfall Model" adalah salah satu metod dalam SDLC. Metod ini digunakan kerana fasa ia bersesuaian dengan jangka masa PSM dan kerperluan sistem dalam membangunkan system. Sistem ini akan dibangunkan menggunakan Microsoft Visual C++ mengikut keperluan system. Utiliti ini juga menggunakan banyak formula matematik untuk mendiagnostik sistem pemproses dan memori. Sistem peroperasian Windows adalah yang bersesuaian untuk melarikan utiliti ini kerana sistem pengoperasian lebih popular pada masa kini.Projek ini penting untuk dibangunkan kerana ia boleh membantu pengguna mengetahui tahap kemampuan sistem mereka, untuk memastikan sistem mereka berfungi dengan baik. Utiliti ini juga mempunyai kelemahan antaranya ialah utiliti hanya boleh beroperasi di dalam platform Windows sahaja.

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ACRONYMS

CPU	Central Processor Unit
CD-ROM	Compact Disk Read Only Memory
HIU	Hardware Information Utility
PC	Personal Computer
NIC	Network Card Interface
OS	Operating System
ROM	Read only Memory
RAM	Random Access Memory
ALU	Arithmetic Logic Unit
CU	Control Unit
SDLC	Software Development Lifecycle
SMART	Self-Monitoring Analysis & Reporting Technology
AUT	Application Unit Testing
LAN	Local Area Network
WAN	Wide Area Network
MB	Mega Byte
KB	Kilo Byte
NTFS	New Technology File System
FAT	File Allocation Table
HIUST	Hardware Information Utility System Testing
HIUUT	Hardware Information Utility Unit Testing
PSM1	Projek Sarjana Muda 1
PSM2	Projek Sarjana Muda 2

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CHAPTER I

INTRODUCTION

1.1 Project Introduction

Hardware Information Utility for Windows is hardware diagnostic and system information tool that can test your computer, determine its configuration and even perform low-level, hardware-direct testing. These extensive test routines detect failures in system components from the CPU to other devices, CD-ROM drives, and PCMCIA cards, as well as providing IRQ and DMA usage under platform Windows 9x/Me/NT/2000/XP environments.

Purpose develops the Hardware Information Utility for diagnostic performance hardware system such as processor and memory. Users can setup this utility to run at system startup, and monitoring hardware to run continuously during operation. Offline diagnostics are also available to allow operators or supervisory applications to test and evaluate each element system, verify the condition of hardware system.

From the research, the hardware utility is very not user friendly, only advance users know how to use and hardware utility function but not the regular user. Normally user does not care about their computers performance and healthy. Besides that the other utility did not give some information or message to user that their hardware cannot function or in low performance. It will cause the system break down.

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The proposition to develop the Hardware Information Utility is to diagnostic all hardware in system, besides that the utility also can give system information for computer and give reminder to user that their hardware cannot function or in low performance.

The methodology to build the Hardware Information Utility is under Microsoft Visual C++ language because the language very popular and easy to understand. This utility will be developed under platform windows.

1.2 Project Objectives

- To create a Hardware Information Utility to diagnostic all system device in personal computer and network computer.
- It displays very extensive details about the processes and modules that are loaded in your memory.
- The utility will be shows real-time resource and memory usage. All the data can be complied into attractive reports.
- The utility can stop the process followed user need, same like Windows task manager.
- The utility give information about memory usage in the system, processor usage in real time and the type of devices the system used.

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1.3 Project Scope

The project scope for the development of personal computer hardware diagnostics and system information for standard user like personal computer and advance user like administrator or client IT organizations. The project was very user friendly utility to use and to setting automatic diagnostic all system in the PC.

The project can support all devices in personal computer or server. In addition, an alternative program based user interface is available which provides greater functionality and improved ease-of-use without compromising this utilities test and system information coverage.

The interface displays an "Explorer" style view of available test functions and applies greater use of color, fonts, graphics and tables to make test information easier to interpret.

1.4 Priority Of Project

- Easily monitor and clean your computer's memory resources at home or office.
- The professional's user to easily monitor the computer's memory resources using detailed reports, and adjust it to personalized settings.
- User has knowledge about performance and reliability their personal computer.
- With the utility you can easily terminate processes which slow down your computer, thus increasing your system's speed and stability.
- It can even terminate "secret" background processes that consume precious memory and CPU time. A new cleaning feature enables you to terminate more than one process at the same time.

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- The utility also enhance your computer's performance by viewing and tweaking each process' priority according to your specific needs.

1.5 Conclusion

The Hardware Information utility will help user to manage and maintain their system. With the utility user can guide to resolve the problem about the system hardware. Its helps to monitor the hardware system by referring to analyze that has been done by the utility.

User also can get information about their system, and also can manage their storage, if their storage very full. User also knows about their memory information and stop the process followed the user command. This show how great is the utility in personal user system and in client network system.

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CHAPTER II

RESEARCH LITERATURE

2.1 Introduction

System Information gives the detailed information about user computer, the peripherals, keyboard, mouse, printers, and multimedia devices attached to your computer, and your computer's Internet and network connections. The information is displayed by category on the nine tabs of the System Information window:

- System--displays general information about your system and its attached hardware.
- Display--shows your computer's display capabilities.
- Printer--shows your computer's printer capabilities.
- Memory--shows the amount of available memory, and indicates how much is being used by each running program.
- Drive--shows the amount of free and used disk space, and indicates the amount occupied by any file.
- Input--shows the types of input devices attached to the computer.
- Multimedia--shows the audio, video, and joystick devices attached to your computer.
- Network--shows information about the Microsoft networks to which your computer is attached.
- Internet--shows details about the system's Internet connection

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System Information can print reports about user system and its components. These reports provide a complete description of your system and are helpful when purchasing new software and installing new hardware. System Information can also benchmark user system, drives, and the multimedia capabilities of your computer.

2.2 Case Study

2.2.1 Hardware Performance Utility

The Hardware Performance Utility is referred to diagnostic hardware in system. All hardware in the system must to diagnostic before load the Operating System. If one of the hardware not functional the system possibility did not load the Operating System. The Hardware Performance Utility very important in each system. This utility also can give information to user what hardware the user use in the system.

Some time its goods to user how their system performance. User also must know the level capability their system when the user executes the job. The utility operate in real time, because the processor and memory operate all time, during the system still on.

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2.2.2 Analysis the of the main component of system

In the first stage analysis, the Micro-controller system has been divided into four major parts:

- Decoder
- Control Unit
- Arithmetic Logic Unit
- Memory-RAM + ROM

There may not be a big requirement to go in details of these right now. Just by this much knowledge we can proceed for this time and later we will explore the details to design for the system-modules & the system.

If we see into the functionality of the system, we can summarize it as follows:

- **Decoder**: This decoder is not the simple ordinary decoder that takes a single line input & provides selective multiple line output. Rather, it is a complex unit in Micro-controller system that has complete information about the instruction set of Micro-controller. These units take an input binary word and gather all information about this word.

    - Whether it is a valid command or not, if it is an instruction from the instruction set of the system.
    - How many data values does it need to be executed? It indicates whether the command operates on one/two/three/No operand.
    - How many other (Next) bytes are to be read for complete instruction & required data information for its execution?

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Finally all this information is sent to control unit for appropriate action and functioning for the system.

- **Control Unit**: The control unit is the heart of any Microprocessor or Microcontroller system. As in a human body, the heart takes the responsibility of circulating the blood in whole body through nerve web, in the same way in a Microcontroller, the Control Unit is responsible for circulating the control & data signal throughout the system through buses.
- The brief functioning of control unit may be summarized as:

  - The control units take the direct input command signal from the command generator & process it to decoder.
  - The Decoder converts this signal to an Op-Code & gives it to the control unit with different other information as discussed above.
  - Control unit checks if it is some control-operation or arithmetic/logic operation. Arithmetic/Logic op-code is sent to ALU for operation.
  - Control unit sends a read/write signal to the memory unit. For the response of a read signal, the memory allows Control unit to read a required location and for write signal, some information may be entered in it. (Memory access)
  - It reads the data from memory & sends it to ALU where it is operated on.
  - Control unit receives results from ALU which is then stored in memory with a write signal.
  - It executes all control and data-transfer operations for the system.

So the Control unit actually controls the flow of data & control signals in the system.

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